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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/894,084	06/28/2001	Alok Dev	US 010292	5316

7590 10/02/2002  
Corporate Patent Counsel  
U.S. Philips Corporation  
580 White Plains Road  
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EXAMINER

FOONG, SUK SAN

ART UNIT	PAPER NUMBER
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2823

DATE MAILED: 10/02/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/894,084

Applicant(s)

DEV, ALOK

Examiner

Suk-San Foong

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 9-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 March 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election of Group II, claims 1-8, in Paper No. 5 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

### *Claim Objections*

2. Claim 6 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The wafer inherently undergoes an aging step in claim 2 which is encompassed by "treatments".

### *Claim Rejections - 35 USC § 112*

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 6 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for limited number of treatments exemplified on instant page 5, does not reasonably provide enablement for "treatment" broadly. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to

practice the invention commensurate in scope with these claims. There is insufficient guidance to enable one in the ordinary skill of the art to determine which treatments parameters would be suitable in practicing the recited method because the term treatment is opened to virtually any process steps including steps which would be unsuitable in the instant process.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lillienfeld et al. ('322) in combination with Baliga et al. ('412).

Lillienfeld et al. disclose a method of forming Schottky rectifier contact which includes forming insulating layer 44 such as oxide on surface of silicon carbide (SiC) wafer 10 (Col. 3, lines 7-8, Col. 4, lines 24-26, and Fig. 2A), then forming mask 12 with window region 49 on insulating layer 44 (Col. 4, lines 28-33, and Fig. 2B), subsequently etching a portion of insulating layer 44 where window region 49 is located (Col. 4, lines 33-36, and Fig. 2C), then depositing conductive material such as reactive metal on the side of mask 14 and window region 49 (Col. 5, lines 3-7, and Fig. 2F), optionally removing or stripping off mask 12 prior to deposition of conductive material (Col. 4, lines 66-68), and subsequently stripping off mask 12 thereby leaving portions of conductive material 64 on wafer surface (Fig. 2G).

Lillienfeld et al. do not teach the step of implanting edge termination layer beneath the wafer surface.

Baliga et al. teach a method of forming Schottky barrier rectifier which includes forming contact 14 on surface 22 of silicon carbide wafer 12 (Col. 4, lines 10-12, and Fig. 1A), and then implanting inert ion such as argon ions (Col. 3, lines 26-27, Col. 7, lines 41-42, and Fig. 1B) thereby forming edge termination layer 16 (Col. 4, lines 30-33, and Fig. 1C).

It would have been within the scope to one ordinary skill in the art to combine both teachings because it would enable formation of an edge termination layer to be performed and obtain further advantage of fabricating silicon carbide devices using convention ion implantation steps and forming high performance devices (Baliga et al., Col. 3, lines 35-40).

7. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lillienfeld et al. ('322) in combination with Baliga et al. ('412) as applied to claims 1-6 and 8 above, and further in view of Thero et al. ('232).

The process of the combination does not include the step recited in claim 7.

Thero et al. disclose a method of forming Schottky diode or contact which includes forming passivation layer over edge termination layer and conductive material of wafer, and then removing portions of passivation layer that cover conductive material thereby allowing access to Schottky contact (Col. 3, lines 56-58).

It would have been within the scope to one ordinary skill in the art to combine the teachings of Thero et al. and the combination because it would enable formation of passivation

layer and contact over SiC wafer 10 of the combination and obtain further advantage of preventing contamination of the device.

*Conclusion*


8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Suk-San Foong whose telephone number is 703-305-0383. The examiner can normally be reached on Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on 703-308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 (7724, 3431, 3432).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

SP  
September 30, 2002

  
George Fourson  
Primary Examiner  
Art Unit 2823